International Journal of Community Medicine and Public Health
Njeru MW et al. Int J Community Med Public Health. 2019 Apr;6(4):1397-1401
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20191366

Original Research Article

Utilization of immunization services among children aged under five in Kirinyaga County, Kenya

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Received: 19 December 2018
Revised: 18 February 2019
Accepted: 01 March 2019

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ABSTRACT

Background: Immunization is the key strategy to curb communicable diseases which are the number one killer of children under five years of age. Immunization prevents mortalities of approximating three million children under five years annually. This study aimed to assess utilization of immunization services among children aged under five in Kirinyaga County, Kenya.
Methods: This was a descriptive cross-sectional study conducted among 388 participants in the five sub-counties of Kirinyaga County through systematic random sampling. Data was collected using a structured interview and review of recorded data from the Children immunization record card. Data was analyzed using SPSS and chi-square tests used to measure the association between independent and dependent variables. Statistical significance was set at $p \leq 0.05$.
Results: Immunization at birth and at 6 weeks was highly utilized at 91%. However, there was a decline during the subsequent visits. Age, gender, profession and level of income were significant factors that affected timely immunization. Health service barriers to utilization included long ques and waiting time, stock out of vaccine and rescheduling of vaccination and clinic return dates. Other identified factors were myths and misconception, side effects, parity and lack of information.
Conclusions: The results showed that utilization of immunization services was not in compliance with the expanded programme on immunization schedule. There is therefore need for health education programs to be carried out to improve utilization of immunization services and a door to door campaign to trace and immunize defaulters.

Keywords: Utilization, Immunization, Under-fives

INTRODUCTION

Global immunization prevents mortalities of approximating 3 million children aged under five years annually with 64% of them being from Africa.[1] Immunization has been regarded as the key strategy to curb communicable diseases which are number one killer of children aged under five.[2] To achieve maximum immunization services, the Kenya expanded programme on immunization (KEPI) recommends adherence to the standard operating procedures to ensure vaccine preventable diseases are controlled, eliminated and eradicated. This can only be possible if staff is properly trained on KEPI, all logistics are available to ensure cold chain is maintained and efficient active and passive surveillance done to detect vaccine preventable diseases (VPD) that might emerge.[3]

In Kenya, the immunization schedule is as follows: BCG and oral polio vaccine is given at birth or within 2 weeks after birth; 3 doses of oral polio, pneumococcal vaccine and pentavalent vaccine all administered at 6 weeks, 10 weeks and 14 weeks; 1 dose of IPV given at 14 weeks; rotavirus vaccine is administered at 6 weeks and 10 weeks. At 6 months' vitamin A is given and measles 1 and 2 vaccine is administered at 9 and 18 months respectively.[4] In Kenya in every nine children, one child dies annually from vaccine preventable diseases before they attain the age of five.[5] According to the centre for disease control (CDC) in Kenya by the year 2015, the mortality rate of under-five stood at 73/1000 live births.[6] A study in Pokot County Kenya noted that despite the Kenyan governments initiative to improve childhood immunization by availing vaccines and training of health workers, immunization services was not accessed by all children thus demonstrating equity gaps.[7]

According to the county health information system (CHIS), Kirinyaga County's under five mortality is at 48/1000 live births.[8] In Kirinyaga County, children vaccinated in the year 2014 were reported to be at 85%.[8] Statistics showed mortalities and morbidities reported to be related to vaccine preventable diseases were; pneumonia 11%, diarrhea 34%, eye and ear infections 18% and 191 cases of confirmed TB.[8] These statistics indicate a gap as there is no correlation between the immunization coverage and mortalities and morbidities related to vaccine preventable disease. The study was prompted by the alarming statistics on morbidities related to vaccine preventable diseases in a county where there has been a lot of intervention on immunization services. The main objective of the study was to assess utilization of immunization services among children aged under five in Kirinyaga County, Kenya.

For proper control and elimination of vaccine preventable diseases which are leader killer and disabling diseases of young children under the age of five years, the provision of immunization services and interventions should be put in place to ensure successful utilization of immunization services that ensures a 'reach every child strategy'. The results and gaps generated from the study formed baseline information that will be used in policy advocacy towards improving immunization services for this key population.

METHODS

This was a descriptive cross-sectional study conducted in 5 sub counties in Kirinyaga County, Kenya that took place between June 2017 to June 2018.Through proportionate sampling, data was collected in the community among 388 participants who had children under five years and have lived for at least five years in Kirinyaga County. To get the participating households, systematic random sampling of every 9th household was done. The respondents were interviewed through a structured questionnaire and the children immunization record card was assessed for data entry. Quantitative data was analyzed using IBM statistical package for social scientists (SPSS). Descriptive data was presented using frequencies, percentages, means and standard deviation while inferential statistics used chi-square test to measure association between independent and dependent variables. P values equal to or less than 0.05 were considered statistically significant.

RESULTS

Social-demographic characteristics of the participants

In this study 79% of the respondents were female, 45% of whom were aged between 20-30 years. Most of the participants were married, had at least a secondary school education however most were unemployed (Table 1).

Table 1: Social-demographic characteristics of the study participants (n=388).

Variables	n	%
Gender		
Male	44	20.6
Female	308	79.4
Age (in years)		
10–20	81	20.9
20–30	174	44.9
30–40	82	21.2
Over 40	51	13.1
Occupation		
Employed	74	19.1
Self–employed	146	37.6
Not–employed	160	41.2
Others student*	8	2.1
Marital Status		
Non-responses	24	6.2
Widows and widowers	13	3.4
Single	169	43.6
Married	182	46.8
Religion		
Christian	361	93
Muslim	19	4.9
Others	8	2.1
Level of education		
None	21	5.4
Primary	161	41.8
Secondary	169	43.6
Tertiary	37	9.7

Level of utilization of the immunization services

The results showed that immunization at birth and at 6 weeks was highly utilized at 91%. There was however a decline trend during the subsequent visits and likewise an ascending trend of children not immunized (Table 2).

Table 2: Level of immunization utilization (n=388).

Variables	Immunized on time		Immunized late		Total immunized		Not immunized	
	(n)	%	(n)	%	(n)	%	(n)	%
At Birth	329	87	25	4	354	91	34	9
At 6 weeks	339	87	15	4	354	91	35	9
At 10 weeks	336	87	14	3	350	90	39	10
At 14 weeks	315	81	3	1	318	82	70	18
At 9 months	296	76	15	4	311	80	77	20
At 18- 59 months	195	50	31	8	226	58	162	42

Table 3: Social-demographic factors associated with utilization of immunization (n=388).

Demographics	n	%	P value
Gender			
Non-responses	36	9.3	0.001
Male	44	11.3	
Female	308	79.4	
Age (years)			
10–20	81	20.9	0.003
20–30	174	44.9	
30–40	82	21.2	
Over 40	51	13.1	
Occupation			
Employed	74	19.1	0.001
Self–employed	146	37.6	
Not –employed	160	41.2	
Others student*	8	2.1	
Income level (Kshs)			
0–2000	171	44.1	0.002
2001–4000	70	18	
4001–6000	99	25.7	
6001–8000	45	11.7	
8001–10, 000	3	0.8	
Religion			
Christian	361	93	0.707
Muslim	19	4.9	
Others	8	2.1	
Educational level			
None	21	5.4	0.001
Primary	161	41.8	
Secondary	169	43.6	
College	25	6.6	
University	12	3.1	

Social-demographic factors associated with utilization of immunization services

Various socio-demographic factors were subjected to a chi-square analysis test to determine whether they significantly affected the decision by respondents to utilize immunization services. Gender, (X^2=68.093 p=0.001-<0.05), age (X^2=212.920, p=0.002-<0.05), profession (X^2=423.442, p=0.001-<0.05), and income (X^2=233.410, p=0.003-<0.05) were statistically significant. Religion however was not statistically significant (Table 3).

Health Service factors facilitating utilization of immunization services

Health service factors were identified as some of the possible reasons facilitating the decision by parents and guardians to utilize immunization services. The respondents were provided with a variety of statements on a Likert scale where they were given five choices to select from; 1=very great effect, 2=great effect, 3=moderate effect, 4=low effect and 5=no effect. The response mean average of 2.79 implies that majority of the responses were skewed towards great effect (Table 4).

Chi-square analysis was also done to show the association between the identified factors and immunization utilization. Long waiting time (X^2=352.709, p=0.001-<0.05), Vaccines out of stock (X^2=233.147, p=0.002-<0.05), rescheduling of vaccines (X^2=206.867, p=0.001-<0.05), and rescheduling of return dates (X^2=199.964, p=0.001-<0.05) were statistically significant. Distance to the health facility was however not significant.

Table 4: Health service factors facilitating utilization of immunization services (n=388).

Variables		n					Mean
		VGE	GE	ME	LE	NE	
Long waiting time	No.	7.2	179	116	18	41	2.65
	%	28	46.1	29.9	4.6	10.9	
Stock out of vaccines	No.	23	150	141	14	49	2.78
	%	5.9	38.7	36.3	3.6	12.6	
Rescheduling of vaccines	No.	19	213	116	3	32	2.52
	%	4.9	54.9	29.9	0.8	8.2	

Continued.

Variables		n					Mean
		VGE	GE	ME	LE	NE	
Return date	No.	38	186	116	7	30	2.48
	%	9.8	47.9	29.9	1.8	7.7	
Distance to health facility	No.	34	62	55	133	98	3.52
	%	8.8	16	14.2	34.3	25.3	
Average		7.32	40.72	28.04	9.02	12.9	2.79

Other factors identified that hindered immunization utilization

Myths and misconception, Immunization side effects, parity and lack of information on immunization were identified as other factors hindering immunization utilization at the county.

DISCUSSION

The study findings revealed that utilization of immunization services for children aged under five for measles 2 is low at 58% which is below the recommended target by WHO of 85%. These findings concur with those of Canavan et al whose findings revealed that majority children had not received all vaccine doses recommended by WHO meaning that not all those children who were started on BCG completed schedules.[9]

Immunization uptake revealed high utilization of initial antigens which are BCG and birth polio given at birth and first pentavalent, polio, rotavarix and pneumococcal vaccines given at 6 weeks while the utilization of subsequent antigens given at 10 weeks, 14 weeks, 9 months and 18 months shows a significant decline. This compares well with a study done in a peri-urban area in Kenya which revealed that utilization of first antigens was high followed by a declining trend in subsequent visits.[10]

Social demographic factors were significant in influencing the utilization of the immunization services by the mothers or caregivers. This included; age, gender, profession and level of income. these findings are supported by several studies that revealed the caregivers or mothers age, level of income, parity, profession or employment, expenditures, educational background, and the number of children a mother had, influenced utilization of immunization.[11-15]

Health system factors were also identified as major barriers to immunization utilizations at the health facilities in the county. The factors include long ques and waiting time, vaccines out of stock and rescheduling of vaccination and clinic return dates. This concurs with a study done by Favina et al who noted that stock out of vaccines lead to missed opportunities and long waiting hours without being served forced mothers/caregivers not to return their children for successive vaccinations.[16]

Other factors identified were vaccine side effect which concurs with a study done in India which revealed that immunization coverage was low due to fear of vaccine side effects.[17] The study also revealed that myths and misconceptions affected utilization of immunization services. These findings are similar to a study conducted in Pakistan which revealed myths and misconceptions as significant factors in utilization of immunization services.[18] Noteworthy, is that the study identified that birth order did not influence the respondents' choice to utilize immunization services and these findings differed from a study conducted by Samra et al which revealed that first born children in Bangladesh are given priority.[19]

CONCLUSION

The study concludes that the level of utilization of immunization services for performance antigens was low below the recommended target by WHO in Kirinyaga County, Kenya. Social demographic factors that facilitate utilization of immunization services are high level of education, while formal employment, income levels, and age are barriers to immunization utilization. The health system factors that are barriers to immunization services are; long waiting time, stock out of vaccines rescheduling of vaccines, lack of information and return dates. Other factors identified as barriers include myths and misconceptions, vaccine side effects, parity, and lack of information.

Delaying or refusing some or all the immunizations puts a child's life and health at risk of contracting vaccine preventable diseases. The county health management team should therefore ensure health workers give health education to the community emphasizing on benefits of immunization and the need to adhere and complete the national child immunization schedule. It should also intensify door to door campaign strategies to trace and vaccinate defaulters of immunization. The county government of health should employ adequate health workers to address the issue of long waiting time, as well as purchase and stock all the health facilities with adequate vaccines to eliminate concerns about stock outs of vaccines that leads to rescheduling of vaccines and return dates.

ACKNOWLEDGEMENTS

We would like to acknowledge the department of population and reproductive health for the support with guidance and materials to conduct this study. Our sincere

gratitude goes to the parents/caregivers in Kirinyaga County who participated in this study. Special gratitude goes to the county director of health and county commissioner Kirinyaga County for allowing us to conduct the study in the community.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Njeru MW, Kabue PN, Gachau AG. Utilization of immunization services among children aged under five in Kirinyaga County, Kenya. Int J Community Med Public Health 2019;6:1397-401.